We claim:

1. A method of preparing thermally stable transitional alumina comprising the steps of:

a) providing an aqueous solution of an aluminum salt;

b) treating the aluminum solution with a hydroxyl group anion-exchanger to produce a composition comprising aluminum hydroxides;

c) freeze-drying the aluminum hydroxide composition to produce a aluminum hydroxide powder; and

d) dehydrating the aluminum hydroxide powder to yield particulates of γ-alumina.

2. The method of claim 1 wherein the salt of aluminum is aluminum nitrate.

3. The method of claim 2 wherein the aqueous solution comprises 1 M $Al(NO_3)_3$.

4. The method of claim 1 wherein the aluminum hydroxide composition has a pH of about 6 to about 8.

5. The method of claim 1 wherein said dehydrating step comprises (i) heating the aluminum hydroxide powder to a temperature of about 600°C to about 800°C to produce γ-alumina and (ii) cooling the γ-alumina.

6. A method of preparing thermally stable transitional alumina comprising the steps of:

a) providing an aqueous solution of an aluminum salt and a salt of a lanthanide series element;

b) treating the aluminum solution with a hydroxyl group anion-exchanger to produce a composition comprising aluminum hydroxides and hydroxides of the lanthanide series element;

c) freeze-drying the hydroxide composition to produce a powder comprising the aluminum hydroxides and the hydroxides of the lanthanide series element; and

d) dehydrating the powder to yield particulates of γ-alumina containing the lanthanide series element.

7. The method of claim 6 wherein the aluminum salt comprises aluminum nitrate.

8. The method of claim 7 wherein the salt of a lanthanide series element comprises lanthanum nitrate.

9. The method of claim 8 wherein a molar ratio of aluminum to lanthanum in the aqueous solution is about 0.0003 to about 0.03.

10. The method of claim 9 wherein a molar ratio of aluminum to lanthanum in the aqueous solution is about 0.001 to about 0.003.

11. The method of claim 8 wherein the concentration of lanthanum oxide in the γ-alumina is about 0.1 to about 0.3 mol%.

12. The method of claim 6 wherein the aluminum hydroxide composition has a pH of about 6 to about 8.

13. The method of claim 6 wherein said dehydrating step comprises (i) heating the aluminum hydroxide powder to a temperature of about 600°C to about 800°C to produce γ-alumina and (ii) cooling the γ-alumina.

14. A catalytic support alumina comprising γ-alumina and lanthanum oxide wherein the concentration of lanthanum oxide in the support is about 0.1 to 0.3 mol%.

15. The composition of claim 14 wherein said alumina retains a specific surface area of over about 85 m^2/g after annealing at about 1000° C for about 3 hours.

16. The composition of claim 14 wherein said alumina is prepared by

a) providing an aqueous solution of an aluminum salt and a lanthanum salt;

b) treating the aluminum solution with a hydroxyl group anion-exchanger to produce a composition comprising aluminum hydroxides and lanthanum hydroxides;

c) freeze-drying the hydroxide composition to produce a powder comprising aluminum hydroxide and lanthanum hydroxide; and

d) dehydrating the powder to yield particulates of γ-alumina containing lanthanum oxide.